
Nomenclatural Actions for the New World Cupresses (Cupressaceae)

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ABSTRACT. A new genus, *Neocupressus* de Laubenfels, is erected for the New World cupresses (Cupressaceae) to separate them from *Callitropsis* Oersted, where they have recently been placed. This is based on several sharp morphological distinctions. A new hybrid nothogenus, \times *Neocupropsis* de Laubenfels, is also erected to accommodate hybrid species from various species of *Neocupressus* and *Callitropsis*. The new combinations are: *Neocupressus arizonica* (Greene) de Laubenfels, *N. arizonica* var. *glabra* (Sudworth) de Laubenfels, *N. arizonica* var. *nevadensis* (Abrams) de Laubenfels, *N. arizonica* var. *montana* (Wiggins) de Laubenfels, *N. bakeri* (Jepson) de Laubenfels, *N. goveniana* (Gordon) de Laubenfels, *N. goveniana* var. *abramsiana* (C. B. Wolf) de Laubenfels, *N. goveniana* var. *pygmaea* (Lemmon) de Laubenfels, *N. guadalupensis* (S. Watson) de Laubenfels, *N. guadalupensis* var. *forbesii* (Jepson) de Laubenfels, *N. lusitanica* (Miller) de Laubenfels, *N. lusitanica* var. *lindleyi* (Klotzsch in Endlicher) de Laubenfels, *N. macnabiana* (A. Murray bis) de Laubenfels, *N. macrocarpa* (Hartweg) de Laubenfels, *N. sargentii* (Jepson) de Laubenfels, \times *Neocupropsis leylandii* (A. B. Jackson & Dallimore) de Laubenfels, \times *N. notabilis* (A. F. Mitchell) de Laubenfels, and \times *N. ovensii* (A. F. Mitchell) de Laubenfels. A lectotype is selected for *N. lusitanica* var. *lindleyi*.

Key words: *Callitropsis*, Cupressaceae, *Cupressus*, *Neocupressus*, New World cupresses, \times *Neocupropsis*.

In order to separate the Old World cupresses from the New World cupresses, Little (2006) placed the New World cupresses into the genus *Callitropsis* Oersted, a conclusion that sidesteps several clear-cut morphological differences. It has long been obvious to me and also to various other botanists (Little et al., 2004; Xiang & Li, 2005) that the New World cupresses differ markedly from the Old World cupresses. In my opinion, this is based on two distinct morphological characters: (1) all of the New World cupresses have multiple cotyledons (three or more; I collected some seedlings with two cotyledons in the southern range of *Neocupressus pygmaea* (Lemmon) de Laubenfels [de Laubenfels, 1963]). All of the Old World cupresses have two cotyledons, but with a distinct further character: the cotyledons are followed

at the same level after germination by two smaller leaves and then by alternating whorls of four leaves, later reduced to whorls of three and then eventually to opposite decussate placement (a character shared by most of the remaining Cupressaceae s. str., de Laubenfels, 1953). Misidentification of *Cupressus lusitanica* Miller, which is widely cultivated and possibly escaped in the Old World, has led to reports of additional cotyledons there. For example, seed from a cultivated plant, said to be *C. assamica* Silba (*C. himalaica* Silba) (Silba, 1994), was grown at Hillier Gardens in England, where it later turned out to be *C. lusitanica* (de Laubenfels, pers. obs.). The New World cypress cotyledons are followed directly by alternating whorls of three or four leaves. Relatives of species with the special dicot habit can lose it, as in several species of *Juniperus* L. and in *Tetraclinis* Masters, but the presence of this unusual cotyledonary trait marks a clear-cut distinction. The occurrence of a few examples of this trait in *N. pygmaea* suggests that it is also a lost trait in the New World cupresses. (2) All of the New World cupresses, except *C. benthamii* Endlicher (see treatment below), have monomorphic leaves. Only rarely are the branchlets distichous (*C. macnabiana* A. Murray bis). All but one of the Old World cupresses (*C. duclouxiana* B. Hickel in Camus) have distichous branchlets whose leaves, furthermore, are dimorphic with lateral leaves keeled so that the branchlets become flattened. The dimorphic character is most obvious on juvenile branchlets and can be more or less obscure or even lost with age. A majority of Cupressaceae genera have the dimorphic habit and, as in Old World cupresses, some related species may have lost it, but the dimorphic leaf trait, where it occurs, is a clear-cut distinction. The distichous habit of branchlets is not lost with age.

Little (2006) based the distinction between the Old World and New World cupresses on a suite of characters, no one alone being diagnostic. He presented a series of cladograms to demonstrate the relationship. In fact, the cotyledonary condition is, indeed, diagnostic. This, then, is further supported by Little's careful statistical analysis. Unfortunately, for identification purposes, the cotyledonary character is not usually available. The distichous habit, for its part, distinguishes all but *Cupressus duclouxiana*

among the Old World species. Because this species, as seen in Little's analysis (Little, 2006), falls well within the suite of Old World cypress characters, it would appear that it has lost the distichous habit rather than being a transitional species. There is no argument here with the generic separation of the Old World cypresses from the New World cypresses, but rather with the strategy of how to bring it about.

In Little's (2006) analysis, he identified two monophyletic groups of species, one being the genus *Juniperus* and the other forming the genus *Callitropsis*, intermediate between the Old World and the New World cypresses. The genus *Juniperus* can be readily distinguished by non-dehiscing cones and other characters. In his analysis, Little found the genus *Callitropsis* to be closer to the New World cypresses than to the Old World cypresses. This led him to consider several strategies, among which he included the placing of the New World cypresses into *Callitropsis* or, conversely, erecting a new genus for the New World cypresses, and he chose the former strategy. This is unfortunate, because no matter how closely the two may be related, they are strikingly different in obvious ways. Not only do the species of *Callitropsis* have markedly distichous ultimate branch systems, but the lateral leaves are sharply bent and distinctly larger like other Cupressaceae genera including *Fokienia* A. Henry & H. H. Thomas, *Thujopsis* Siebold & Zuccarini, *Calocedrus* Kurz, and *Libocedrus* Endlicher, particularly at the juvenile stage. Furthermore, both species, on juvenile shoots, show a clear differentiation between the upper and the lower sides of the branchlets. Another distinction is the small cones of *Callitropsis* normally with only four fertile scales, where all cypresses normally have six or more. The dimorphic leaf sizes, sometimes different for leaves on the upper branchlet surface versus those on the lower branchlet surface, as well as the smaller cones make *Callitropsis* differ from the New World cypresses in ways that the Old World cypresses do not. The two previously described species of *Callitropsis* further have the cotyledonary condition of the Old World cypresses and rather few seeds per fertile scale.

The position of *Cupressus benthamii* requires special consideration at this point. It is often considered a variety of *C. lusitanica* simply because they both grow in Mexico. These two taxa are sharply different. *Cupressus benthamii* has well-marked distichous branchlets with distinctly dimorphic leaves such that the ultimate branch systems are strongly flattened. The seed cones normally have only four fertile scales. These characters not only distinguish it from *C. lusitanica*, but also from all other New World cypresses while allying it with *Callitropsis*. One of Little's cladograms (Little, 2006: 469, fig. 4) actually

groups it (along with *Cupressus funebris* Endlicher) with *Callitropsis*. Because of these obvious distinctions and because, in my experience, most specimens in herbaria and arboreta identified as *C. benthamii* have been misidentified, I consider that error may have contaminated the data used by Little (although, to be sure, Little's personal collections at BH are correctly identified). For that reason, I am not prepared to separate it from *Callitropsis* as I would all the remaining species of New World cypresses. Unlike the other *Callitropsis* species, but like *C. lusitanica*, *C. benthamii* has three or four cotyledons and has numerous seeds per fertile scale. These conditions could be the result of introgression from *C. lusitanica*. It is worth noting that *Callitropsis* (*Cupressus*) *benthamii* is morphologically very close to \times *Neocupressis leylandii* (A. B. Jackson & Dallimore) de Laubenfels, a hybrid between *Callitropsis* and *Neocupressis*, the main distinction being that the latter normally has six seed cone scales.

In order to separate the New World cypresses from *Callitropsis* (including *Cupressus benthamii*), it is necessary to erect a new genus, for which the name *Neocupressis* is here proposed. Eight species and seven varieties are involved. There are nine species of Old World cypress and, with *C. benthamii*, three species of *Callitropsis*. This treatment would require a small revision of the genus *Callitropsis*.

I. *Neocupressis* de Laubenfels, gen. nov. TYPE:
Neocupressis macrocarpa (Hartweg) de Laubenfels.

Hoc genus a *Callitropside* Oersted foliis non dimorphis et strobili feminei squamis fertilis plerumque 6 ad 12 (raro 4) differt.

Trees or shrubs with multiple cotyledons (3 or more, most commonly 4 [Wolf, 1948]; in a few species 3 may be most common); branchlets not distichous or rarely distichous. Leaves in alternate whorls, each whorl at first in seedlings usually of 4 linear leaves, gradually reduced to whorls of 3, and finally opposite decussate leaves scale-like when adult and similar (never differentiated into lateral and facial forms). Seed cones with 6 to 12 peltate woody fertile scales (sporadically 4), 8 to 15 erect seeds per fertile scale (sometimes less on lowest or uppermost scales).

Infrataxa as varieties are applied here, as historically they have been most used in *Cupressus* L. Synonyms are given only where not found in Wolf (1948) or Farjon (2005) or where they are different from these.

1. *Neocupressis arizonica* (Greene) de Laubenfels, comb. nov. Basionym: *Cupressus arizonica*

Greene, Bull. Torrey Bot. Club 9: 64. 1882. *Cupressus benthamii* Endlicher var. *arizonica* (Greene) Masters, J. Linn. Soc. Bot. 31: 340. 1896. *Callitropsis arizonica* (Greene) D. P. Little, Syst. Bot. 31: 473. 2006. TYPE: U.S.A. Arizona: Clifton (on the mountains back of Clifton), 1 Nov. 1880, *E. L. Greene s.n.* (lectotype, designated by Little, 2006: 473, NDG not seen; isotypes, K, NA not seen, NY).

The type variety of *Neocupressus arizonica* is substantially variable, especially as to the degree of leaf gland activity, peeling of the bark, and number of serotinous seed cones, such that examples closer to its varieties or other species could be selected within normal populations.

1a. *Neocupressus arizonica* (Greene) de Laubenfels var. ***arizonica***.

1b. *Neocupressus arizonica* (Greene) de Laubenfels var. ***glabra*** (Sudworth) de Laubenfels, comb. nov. Basionym: *Cupressus glabra* Sudworth, Amer. Forest. 16: 88. 1910. *Cupressus arizonica* Greene var. *glabra* (Sudworth) Little, Madroño 18: 162. 1966. *Cupressus arizonica* Greene subsp. *glabra* (Sudworth) A. E. Murray, Kalmia 12: 19. 1982. *Callitropsis glabra* (Sudworth) D. P. Little, Syst. Bot. 31: 473. 2006. TYPE: U.S.A. Arizona: Yavapai Co., N slope of Verde River Canyon, 29 Dec. 1909, *G. B. Sudworth s.n.* (holotype, US; isotypes, A, ARIZ not seen, RSA, USFS not seen).

Cupressus stephensonii C. B. Wolf, Aliso 1: 125. 1948, syn. nov. *Cupressus arizonica* Greene var. *stephensonii* (C. B. Wolf) E. L. Little, Madroño 18: 164. 1966. *Cupressus arizonica* Greene subsp. *stephensonii* (C. B. Wolf) E. Murray, Kalmia 12: 19. 1982. *Callitropsis stephensonii* (C. B. Wolf) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: U.S.A. California: San Diego Co., Cuyamaca Mtns., upper limit of King Creek, 1 Dec. 1938, *C. B. Wolf 9467* (holotype, RSA; isotypes, BH, CAS not seen, K, MEXU not seen, MO not seen, NA not seen, NY).

Cupressus arizonica Greene var. *reveliana* J. Silba, Phytologia 49: 393. 1981, syn. nov. *Cupressus arizonica* Greene subsp. *reveliana* (Silba) Silba, J. Int. Conif. Preserv. Soc. 12: 51. 2005. TYPE: Mexico. Baja California N: Sierra Juarez, 2 km NE of El Rincon, 21 Apr. 1974, *R. Moran 21251* (holotype, SD not seen; isotype, MO not seen).

Neocupressus arizonica var. *glabra* has bark peeling in plates rather than the fibrous bark in strips of the type variety and is generally much more glaucous with more active leaf glands.

Cupressus stephensonii is known from one small population near San Diego, California. The large seed lies within the size range of seed of variety *glabra*.

Farjon (2005) placed *Cupressus arizonica* var. *reveliana* in synonymy with his variety *stephensonii* such that now it must be transferred to synonymy with variety *glabra*. The relatively small seed in this small population is within the size range of variety *glabra*.

1c. *Neocupressus arizonica* (Greene) de Laubenfels var. ***nevadensis*** (Abrams) de Laubenfels, comb. nov. Basionym: *Cupressus nevadensis* Abrams, Torreya 19: 92. 1919. *Cupressus macnabiana* A. Murray bis var. *nevadensis* (Abrams) Abrams, Ill. Fl. Pacific States 1: 73. 1923. *Cupressus arizonica* Greene var. *nevadensis* (Abrams) Little, Madroño 18: 164. 1966. *Cupressus arizonica* Greene subsp. *nevadensis* (Abrams) A. E. Murray, Kalmia 12: 19. 1982. *Callitropsis nevadensis* (Abrams) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: U.S.A. California: Kern Co., Piute Mtns., Red Hill near Bodfish, 29 July 1915, *L. Abrams 5368* (holotype, DS not seen; isotypes, NY, RSA, US).

The variety *nevadensis* has blunter umbos on the seed cone scales and much more active glands on the leaves than the type variety.

1d. *Neocupressus arizonica* (Greene) de Laubenfels var. ***montana*** (Wiggins) de Laubenfels, comb. nov. Basionym: *Cupressus montana* Wiggins, Contr. Dudley Herb. 1: 161. 1933. *Cupressus arizonica* Greene var. *montana* (Wiggins) Little, Madroño 18: 163. 1966. *Cupressus arizonica* Greene subsp. *montana* (Wiggins) A. E. Murray, Kalmia 15: 11. 1985. *Callitropsis montana* (Wiggins) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: Mexico. Baja California: Sierra San Pedro Mártir, La Encantada, 22 Sep. 1930, *I. L. Wiggins & D. Demaree 4990* (holotype, DS not seen; isotypes, F not seen, MEXU not seen, NA not seen, NY, RSA, SD not seen, US).

Variety *montana* differs from the type variety in the immediate opening of the seed cones upon maturity.

2. *Neocupressus bakeri* (Jepson) de Laubenfels, comb. nov. Basionym: *Cupressus bakeri* Jepson, Fl. Calif. 1: 61. 1909. *Cupressus macnabiana* A. Murray bis var. *bakeri* (Jepson) Jepson, Man. Fl. Pl. Calif. 58. 1923. *Callitropsis bakeri* (Jepson) D. P. Little, Syst. Bot. 31: 473. 2006. TYPE: U.S.A. California: Siskiyou Co., near Dana, Aug. 1898, *M. S. Baker s.n.* (holotype, JEPS not seen).

3. *Neocupressus goveniana* (Gordon) de Laubenfels, comb. nov. Basionym: *Cupressus goveniana* Gordon, J. Hort. Soc. London 4: 295. 1849. *Callitropsis goveniana* (Gordon) D. P. Little, Syst. Bot. 31: 473. 2006. TYPE: U.S.A. California: Monterey Co., 2 mi. from sea, 1849, *Hartweg s.n.* (cultivated from seed) (holotype, K).

3a. *Neocupressus goveniana* (Gordon) de Laubenfels var. ***goviana***.

Cupressus goveniana Gordon subsp. *gibsonensis* Silba, J. Int. Conifer Preserv. Soc. 10: 32. 2003, syn. nov. TYPE: U.S.A. California: Monterey Co., Gibson Creek, 26 Oct. 2003, *J. Silba B289* (holotype, NY).

Cupressus abramsiana C. B. Wolf subsp. *neolomondensis* Silba, J. Int. Conif. Preserv. Soc. 10: 33. 2003, syn. nov. TYPE: U.S.A. California: Santa Cruz Co., Majors Creek, near Ben Lomond Peak, Jan. 2003, *J. Silba B314* (holotype, NY).

Subspecies *gibsonensis* highlights the non-dwarfed form of the type variety found also in the type locality, with trees to 7 m and seed cones about 2 cm long with seed to 4 mm long.

Subspecies *neolomondensis* differs from variety *abramsiana* in the non-glaucousness of the seed such that the subspecies as described is identical to the variety *goviana*. The subspecies *neolomondensis* population adds a third grove to variety *goviana* on the north side of Monterey Bay. A fourth grove is found near Anchor Bay in Mendocino County near the variety *pygmaea*.

3b. *Neocupressus goveniana* (Gordon) de Laubenfels var. ***abramsiana*** (C. B. Wolf) de Laubenfels, comb. nov. Basionym: *Cupressus abramsiana* C. B. Wolf, Aliso 1: 215. 1948. *Cupressus goveniana* Gordon var. *abramsiana* (C. B. Wolf) Little, Phytologia 20: 435. 1970. *Cupressus goveniana* Gordon subsp. *abramsiana* (C. B. Wolf) A. E. Murray, Kalmia 12: 19. 1982. *Callitropsis abramsiana* (C. B. Wolf) D. P. Little, Syst. Bot. 31: 473. 2006. TYPE: U.S.A. California: Santa Cruz Co., Ben Lomond near Bonnie Doon, 9 Nov. 1934, *C. B. Wolf 6235* (holotype, RSA; isotypes, BH, CAS not seen, DS not seen, K, MEXU not seen, MO not seen, NA not seen, NY).

Variety *abramsiana* differs primarily in the glaucousness of the seeds, which may be due to introgression from nearby stands of *Neocupressus sargentii* (Jepson) de Laubenfels, which until now have been misidentified as *Cupressus abramsiana* (perhaps due to their geography!). Strictly speaking, this variety occurs only in the vicinity of Bonnie Doon in California.

3c. *Neocupressus goveniana* (Gordon) de Laubenfels var. ***pygmaea*** (Lemmon) de Laubenfels, comb. nov. Basionym: *Cupressus goveniana* Gordon var. *pygmaea* Lemmon, Cone-bear. Trees Pacif. Slope ed. 3: 77. 1895, as *pigmaea*. *Cupressus pygmaea* (Lemmon) Sargent, Bot. Gaz. 31: 239. 1901. *Cupressus goveniana* Gordon subsp. *pygmaea* (Lemmon) A. Camus, Encycl. Econ. Sylvicult. 2: 50. 1914. *Callitropsis pygmaea* (Lemmon) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: U.S.A. California: Mendocino Co., White Plains, back from the coast, [1880s], *J. G. Lemmon & wife s.n.* (lectotype, designated by Wolf, 1948: 200, UC not seen; isotype, DS not seen).

Variety *pygmaea* differs from the type variety in *Neocupressus goveniana* in having shiny black seeds that are not dull blackish to dark brown. The inclusion of the Anchor Bay grove in this variety by Wolff (1948) and many others (rather than the type variety of *N. goveniana*) has confused the status of variety *pygmaea*.

4. *Neocupressus guadalupensis* (S. Watson) de Laubenfels, comb. nov. Basionym: *Cupressus guadalupensis* S. Watson, Proc. Amer. Acad. Arts, n.s. 14: 300. 1879. *Cupressus macrocarpa* Hartweg var. *guadalupensis* (S. Watson) Masters, Gard. Chron., ser. 3, 18: 62. 1895. *Callitropsis guadalupensis* (S. Watson) D. P. Little, Syst. Bot. 31: 473. 2006. TYPE: Mexico. Guadalupe Island, 1875, *E. Palmer 92* (holotype, GH; isotypes, CHS not seen, K, NA not seen, NY, P not seen).

4a. *Neocupressus guadalupensis* (S. Watson) de Laubenfels var. ***guadalupensis***.

4b. *Neocupressus guadalupensis* (S. Watson) de Laubenfels var. ***forbesii*** (Jepson) de Laubenfels, comb. nov. Basionym: *Cupressus forbesii* Jepson, Madroño 1: 75. 1922. *Cupressus guadalupensis* S. Watson var. *forbesii* (Jepson) Little, Phytologia 20: 435. 1970. *Cupressus guadalupensis* S. Watson subsp. *forbesii* (Jepson) R. M. Beauchamp, Aliso 9: 191. 1978. *Callitropsis forbesii* (Jepson) D. P. Little, Syst. Bot. 31: 473. 2006. TYPE: U.S.A. California: San Diego Co., betw. El Nido & Dulzura, 30 Dec. 1907, *C. N. Forbes s.n.* (holotype, JEPS not seen; isotypes, BH, CAS not seen, DS not seen, MEXU not seen, MO not seen, NA not seen, NY, RSH not seen, UC not seen, US).

Cupressus forbesii Jepson has been widely considered a variety of *C. guadalupensis*, differing in the

lack of glaucousness and a slightly shorter pollen cone.

- 5. *Neocupressus lusitanica*** (Miller) de Laubenfels, comb. nov. Basionym: *Cupressus lusitanica* Miller, Gard. Dict., ed. 8, no. 3. 1768. *Callitropsis lusitanica* (Miller) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: Portugal. Cultivated in Herb. Miller, *anonymous s.n.* (holotype, BM).

The origin of *Neocupressus lusitanica* has long been a problem inasmuch as it was described from Old World material. Martinez (1942), in particular, rejected a Mexican origin. More recently, Silba (1994) has pressed that claim. However, most, if not all of the critical material from the Old World is from cultivation, and I have personally collected material exactly of the species in the forests on the slopes of Mt. Ixtacihuatl along the route of conquistadors where cypresses surely were first encountered in Mexico by Europeans (*de Laubenfels* 687, personal collection). Franco (1945) and Farjon (1993, 2005) have made the case for a New World origin, the position adopted here. My collection could be considered an epitype.

- 5a. *Neocupressus lusitanica*** (Miller) de Laubenfels var. ***lusitanica***.

Cupressus himalaica Silba var. *darjeelingensis* Silba, Phytologia 68: 29. 1990, syn. nov. *Cupressus darjeelingensis* (Silba) Silba, J. Int. Conifer Preserv. Soc. 1: 18. 1994. TYPE: India. W. Bengal: cult. near Kalimpong, s.d., *C. G. Trevor s.n.* (holotype, K).

Silba's (1990) description of *Cupressus himalaica* var. *darjeelingensis* material does not match his holotype, which is *Neocupressus lusitanica*, in that he reports flattened branchlets in long chain-like segments.

- 5b. *Neocupressus lusitanica*** (Miller) de Laubenfels var. ***lindleyi*** (Klotzsch in Endlicher) de Laubenfels, comb. nov. Basionym: *Cupressus lindleyi* Klotzsch in Endlicher, Syn. Conif.: 59. 1847. *Cupressus lusitanica* Miller var. *lindleyi* (Klotzsch in Endlicher) Carrière, Traité Gén. Conif., ed. 2: 156. 1867. *Cupressus benthamii* Endlicher var. *lindleyi* (Klotzsch in Endlicher) Masters, J. Linn. Soc., Bot. 31: 339. 1896. TYPE: Mexico. Michoacán: betw. Angangueo & Tlalpuexahua, 1839, *C. T. Hartweg* 437 (lectotype, designated here, K; isotypes, BM, MO not seen).

Cupressus lindleyi is better identified as a more robust variety of the species *Neocupressus lusitanica*

that is common to drier and more exposed locations. Martinez (1942) took great pains to distinguish *C. lindleyi* from *C. lusitanica* because of his belief that the latter was not of Mexican origin. My own experience collecting in Mexico supports the conclusion that two varieties are involved. The holotype of *C. lindleyi* has been destroyed, but isotypes exist from which a lectotype was selected.

- 6. *Neocupressus macnabiana*** (A. Murray bis) de Laubenfels, comb. nov. Basionym: *Cupressus macnabiana* A. Murray bis, Edinburgh New Philos. J., n.s. 1: 293. 1855. *Callitropsis macnabiana* (A. Murray bis) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: U.S.A. California: "circa lat. 41° Bor.," Sep.? 1854, *W. Murray s.n.* (holotype, E).

- 7. *Neocupressus macrocarpa*** (Hartweg) de Laubenfels, comb. nov. Basionym: *Cupressus macrocarpa* Hartweg, J. Hort. Soc. London 2: 187. 1847. *Callitropsis macrocarpa* (Hartweg) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: U.S.A. California: Monterey Co., Carmel Bay, 1846, *K. T. Hartweg* 143 (holotype, K).

Cupressus macrocarpa Hartweg subsp. *lobosensis* Silba, J. Int. Conifer Preserv. Soc. 10: 30. 2003, syn. nov. TYPE: U.S.A. California: Monterey Co., Point Lobos, 16 Oct. 2002, *J. Silba* B249 (holotype, NY).

The subspecies *lobosensis*, from the southern grove population of the species in Monterey County, as described by Silba in 2003, lies within the range of characters of the type and tends to emphasize the tendency of older trees of *Cupressus macrocarpa* to have larger seed cones and thicker foliage, also found in its type locality on Carmel Bay.

- 8. *Neocupressus sargentii*** (Jepson) de Laubenfels, comb. nov. Basionym: *Cupressus sargentii* Jepson, Fl. Calif. 1: 61. 1909. *Cupressus goveniana* Gordon var. *sargentii* (Jepson) A. Henry in Elwes & A. Henry, Trees Great Britain 1173. 1910. *Callitropsis sargentii* (Jepson) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: U.S.A. California: Mendocino Co., Mayacamas Range, Red Mtn., 18 June 1908, *W. L. Jepson* 3027 (holotype, JEPS not seen).

Cupressus abramsiana C. B. Wolf subsp. *locatellii* Silba, J. Int. Conifer Preserv. Soc. 10: 32. 2003, syn. nov. TYPE: U.S.A. California: Santa Cruz Co., Eagle Rock, Dec. 2002, *J. Silba* B301 (holotype, NY; isotype, RSA).

Differences of subspecies *locatellii* and the following synonymous taxa from *Neocupressus go-*

veniana var. *abramsiana* place them in *N. sargentii* with only minor morphological differences at best. They are found at roughly the midpoint of the distribution for *N. sargentii*, which extends from Mendocino County in the north to Santa Barbara County in the south. This subspecies has rather smaller seeds (only 2.5–3 mm long) than usual for *N. sargentii*, which has seeds at least 3.2 mm long.

Cupressus abramsiana C. B. Wolf subsp. *opleri* Silba, J. Int. Conifer Preserv. Soc. 10: 33. 2003, syn. nov. TYPE: U.S.A. California: Santa Cruz Co., near Forest Springs, Dec. 2002. J. Silba, D. Taylor & A. Opler B311 (holotype, NY; isotype, RSA).

Subspecies *opleri* has light green (not dusty green as in variety *sargentii*) foliage and rather smaller seeds (2.5–3 mm long) than *N. sargentii*.

Cupressus abramsiana C. B. Wolf subsp. *butanoensis* Silba, J. Int. Conifer Preserv. Soc. 10: 34. 2003, syn. nov. TYPE: U.S.A. California: San Mateo Co., Butano Ridge, s.d., C. McMillan 1620 (holotype, NY).

There are no distinctions between the description of subspecies *butanoensis* by Silba and *Neocupressus sargentii*. The fact that *butanoensis* (and the above two subspecies, *locatellii* and *opleri*) do not grow on serpentine like typical *N. sargentii* (Wolf, 1948) is not sufficient basis for separation.

KEY TO THE SPECIES OF *NEOCUPRESSUS*

- 1a. Active glands on at least some of the leaves (leaves never rich green).
 - 2a. Immature seed cone scale conical-acute, branchlets distichous. 6. *N. macnabiana*
 - 2b. Seed cone scales peltate with a central umbo, branchlets not distichous.
 - 3a. Seed cone scales covered with warts, branchlets to 1.3 mm diam. 2. *N. bakeri*
 - 3b. Seed cone scales not warty, branchlets to 1.7 mm diam. 1. *N. arizonica*
- 1b. Glands inactive to absent.
 - 4a. Seed cone serotinous, at least partially.
 - 5a. Bark fibrous in strips.
 - 6a. Usually 8 pollen sacs per scale, seed cone 24–33 mm diam. (seed not glaucous, foliage bright green). 7. *N. macrocarpa*
 - 6b. Never 8 pollen sacs per scale, seed cone 15–25 mm diam.
 - 7a. Pollen sacs 3 to 4 per scale, branchlets 1.5–2 mm diam. (seed glaucous, foliage dull green) 8. *N. sargentii*
 - 7b. Pollen sacs 5 to 6 per scale, branchlets 1–1.5 mm diam. 3. *N. goveniana*
 - 5b. Bark exfoliating in plates (branchlets 1–1.4 mm diam., seed not glaucous) 4. *N. guadalupensis*
 - 4b. Seed cone always opening on maturity (bark fibrous, 4 pollen sacs per scale, seed not glaucous) . . . 5. *N. lusitanica*

Several hybrids involving *Callitropsis nootkatensis* (D. Don) Oersted ex D. P. Little, and various species of New World cypresses have been reported by Jackson and Dallimore (1926) and Mitchell (1970) and have been placed in the hybrid genus \times *Cupressocyparis* Dallimore, formed from the genera *Chamaecyparis* Spach (considered the genus for *C. nootkatensis*) and *Cupressus*. Because the genera involved in the parent formula for the nothogenus have changed, the name of the hybrid genus \times *Cupressocyparis* must also be changed, for which the name \times *Neocupropsis* is proposed.

II. \times *Neocupropsis* de Laubenfels, nothogen. nov. TYPE: \times *Neocupropsis leylandii* (A. B. Jackson & Dallimore) de Laubenfels.

\times *Cupressocyparis* Dallimore, Forestry 11: 3. 1937.
 \times *Cuprocyparis* Farjon, Novon 12: 188. 2002.

1. \times *Neocupropsis leylandii* (A. B. Jackson & Dallimore) de Laubenfels, comb. nov. Basionym: *Cupressus* \times *leylandii* A. B. Jackson & Dallimore, Bull. Misc. Inform. Kew 1926: 114. 1926. \times *Cupressocyparis leylandii* (A. B. Jackson &

Dallimore) Dallimore, Forestry (Oxford) 11: 3. 1937. \times *Cuprocyparis leylandii* (A. B. Jackson & Dallimore) Farjon, Novon 12: 188. 2002. *Callitropsis* \times *leylandii* (A. B. Jackson & Dallimore) D. P. Little, Syst. Bot. 31: 474. 2006. TYPE: United Kingdom. Northumberland: Haggerston Castle, (cultivated), 26 Nov. 1925, E. J. Leyland s.n. (lectotype, designated by Farjon et al., 2002: 188, K not seen).

2. \times *Neocupropsis notabilis* (A. F. Mitchell) de Laubenfels, comb. nov. Basionym: \times *Cupressocyparis notabilis* A. F. Mitchell, J. Roy. Hort. Soc. 95(10): 453. 1970. \times *Cuprocyparis notabilis* (A. F. Mitchell) Farjon, Novon 12: 188. 2002. TYPE: United Kingdom. Hampshire: Forest Research Station, Alice Holt Lodge, (cultivated), 31 July 1963, A. F. Mitchell s.n. (holotype, K not seen).

3. \times *Neocupropsis ovensii* (A. F. Mitchell) de Laubenfels, comb. nov. Basionym: \times *Cupressocyparis ovensii* A. F. Mitchell, J. Roy. Hort. Soc. 95(10): 454. 1970. \times *Cuprocyparis ovensii*

(A. F. Mitchell) Farjon, Novon 12: 188. 2002. TYPE: United Kingdom. Hampshire: Forest Research Station, Alice Holt Lodge, (cultivated), 1970, *A. F. Mitchell s.n.* (holotype, K not seen).

All three \times *Neocupropsis* species are strictly horticultural in origin and, because they all involve *Callitropsis nootkatensis*, they are quite similar. \times *Neocupropsis leylandii* is a hybrid with *Neocupressus macrocarpa* and is very similar to *C. nootkatensis* including seed cones to 20 mm in diameter but without the drooping branches. \times *Neocupropsis notabilis* is a hybrid with *Neocupressus arizonica* var. *glabra* and has much more open branching with glaucous seed cones only 12 mm in diameter. \times *Neocupropsis ovensii* is a hybrid with *Neocupressus lusitanica* and has the open branching with the drooping habit and also small glaucous seed cones.

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